

# Project WILD and the Virginia Standards of Learning for Science



The Project WILD Activity Guides have been correlated to the 2003 Virginia Standards of Learning objectives for Science. These correlations are to those activities that directly match the Science SOLs as they are written; extensions, adaptations or secondary objectives are not included. Many additional activities will assist a teacher's effort to meet SOL objectives in science, math and language arts. Reviewing the activities in the Project WILD guide along with the Topic, Subject, and Skills indexes found in the appendices will create a comprehensive correlation to the standards.

Topics such as food webs are part of the standards at different grade levels and build upon knowledge learned at an earlier grade. Activities in this correlation are listed where they would best meet the student's skill level and the SOL. Teachers are encouraged to adapt activities to the abilities of their students.

Within Virginia's Science SOLs, the first objective or ".1" standard deals with basic Science Process Skills such as *classification* and *predicting* as well as the *Nature of Science*. All Project WILD activities will help build on the natural curiosity students have in natural sciences and support the .1 objectives. Teachers are referred to the *Skills Index* in the back of their Project WILD Activity Guides for activities that would assist in teaching any given skill.

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To download the complete correlation visit: [http://www.dgif.virginia.gov/education/wildlife\\_education.html](http://www.dgif.virginia.gov/education/wildlife_education.html)

Project WILD is sponsored in Virginia by the Department of Game and Inland Fisheries and the Virginia Division of the Izaak Walton League of America.

**PROJECT WILD CORRELATION TO  
VIRGINIA'S SCIENCE STANDARDS OF LEARNING**

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**Kindergarten**

- K.2 Students will investigate and understand that humans have senses that allow one to seek, find, take in, and react or respond to information in order to learn about one's surroundings. Key concepts include:**
- a. five senses and corresponding sensing organ (taste-tongue, touch-skin, smell-nose, hearing-ears, and sight-eyes); and
  - b. sensory descriptors (sweet, sour, bitter, salty, rough/smooth, hard/soft, cold, warm, hot, loud/soft, high/low, bright/dull)

**Project WILD K-12 Guide**

*Learning to Look – Looking to See*

- K.6 The student will investigate and understand basic needs and life processes of plants and animals. Key concepts include:**
- a. living things change as they grow and need food, water, and air to survive;
  - b. plants and animals live and die (go through a life cycle);
  - c. offspring of plants and animals are similar but not identical to their parents and one another.

**Project WILD K-12 Guide**

*Everybody Needs a Home  
What's That Habitat?*

**Project WILD Aquatic Guide**

*Are You Me?*

- K.8 The student will investigate and understand simple patterns in his/her daily life.**

**Key concepts include**

- a. weather observations;
- b. the shapes and forms of many common natural objects including seeds, cones, and leaves;
- c. animal and plant growth; and
- d. home and school routines.

**Project WILD K-12 Guide**

*Color Crazy  
What's That Habitat?*

**Project WILD Aquatic Guide**

*Are You Me?  
Water Plant Art*

- K.10 The student will investigate and understand that materials can be reused, recycled and conserved. Key concepts include**

- a. materials and objects can be used over and over again;
- b. everyday materials can be recycled; and
- c. water and energy conservation at home and in school helps preserve resources for future use.

**Project WILD Aquatic Guide**

*Plastic Jellyfish  
Aqua Words*

## First Grade

**1.4 The student will investigate and understand that plants have life needs and functional parts and can be classified according to certain characteristics. Key concepts include:**

- a. needs (food, air water, light, and a place to grow);
- b. parts (seeds, roots, stems, leaves, blossom, fruit); and
- c. characteristics: edible/non-edible, flowering/non-flowering, evergreen/deciduous.

### **Project WILD Aquatic Guide**

*Water Plant Art*

**1.5 The student will investigate and understand that animals, including people, have life needs and specific physical characteristics and can be classified according to certain characteristics. Key concepts include:**

- a. life needs (air, food, water, and a suitable place to live);
- b. physical characteristics (body coverings, body shape, appendages, and methods of movement);
- c. characteristics (wild/tame, water homes/land homes).

### **Project WILD K-12 Guide**

*What's Wild?*

*Color Crazy*

*What Bear Goes Where?*

*Beautiful Basics*

*Grasshopper Gravity*

### **Project WILD Aquatic Guide**

*Fashion a Fish*

*Water We Eating?*

**1.7 The student will investigate and understand the relationship of seasonal change and weather to the activities and life processes of plants and animals. Key concepts include:**

- a. how temperature, light, and precipitation bring about changes in plants (growth, budding, falling leaves, wilting);
- b. animals (behaviors, hibernation, migration, body covering, and habitat);
- c. people (dress, recreation, work).

### **Project WILD K-12 Guide**

*The Thicket Game*

*Make a Coat*

*Stormy Weather (indirect)*

**1.8 The student will investigate and understand that natural resources are limited. Key concepts include**

- a. identification of natural resources (plants and animals, water, air, land, minerals, forests and soil);
- b. factors that affect air and water quality; and
- c. recycling, reusing and reducing consumption of natural resources.

### **Project WILD K-12 Guide**

*What's Wild*

*Learning to Look, Looking to See*

## Second Grade

**2.4 The student will investigate and understand that plants and animals go through a series of orderly changes in their life cycles. Key concepts include:**

- a. some animals (frogs and butterflies) go through distinct stages during their lives while others generally resemble their parents;
- b. flowering plants undergo many changes from the formation of the flower to the development of the fruit.

### **Project WILD Aquatic Guide**

*Are You Me?*

*Hooks and Ladders*

**2.5 The student will investigate and understand that living things are part of a system. Key concepts include:**

- a. living organisms are interdependent with their living and nonliving surroundings;
- b. habitats change over time due to many influences.

### **Project WILD K-12 Guide**

*Wildlife is Everywhere*

*What Bear Goes Where?*

*Forest In a Jar*

### **Project WILD Aquatic Guide**

*Puddle Wonders*

*Marsh Munchers*

**2.7 The student will investigate and understand that weather and seasonal changes affect plants, animals, and their surroundings. Key concepts include**

- a. effects on growth and behavior of living things (migration, hibernation, camouflage, adaptation, dormancy); and
- b. weathering and erosion of the land surface

### **Project WILD K-12 Guide**

*Color Crazy*

*Surprise Terrarium*

*What Bear Goes Where*

### **Project WILD Aquatic Guide**

*Silt: A Dirty Word*

**2.8 The student will investigate and understand that plants produce oxygen and food, are a source of useful products, and provide benefits in nature. Key concepts include:**

- a. important plant products (fiber, cotton, oil, spices, lumber, rubber, medicines, and paper);
- b. the availability of plant products affects the development of a geographic area;
- c. plants provide homes and food for many animals and prevent soil from washing away.

### **Project WILD K-12 Guide**

*What's for Dinner?*

### **Project WILD Aquatic Guide**

*Water We Eating?*

*Water Plant Art*

## Third Grade

**3.4 The student will investigate and understand that behavioral and physical adaptations allow animals to respond to life needs. Key concepts include:**

- a. methods of gathering and storing food, finding shelter, defending themselves, and rearing young;
- b. hibernation, migration, camouflage, mimicry, instinct, and learned behavior.

### **Project WILD K-12 Guide**

*Ants on a Twig*

*Seeing is Believing*

*Surprise Terrarium*

*Adaptation Artistry*

### **Project WILD Aquatic Guide**

*Marsh Munchers*

*Fashion A Fish*

*Sockeye Scents*

**3.5 The student will investigate and understand relationships among organisms in aquatic and terrestrial food chains. Key concepts include:**

- a. producer, consumer, decomposer;
- b. herbivore, carnivore, omnivore;
- c. predator-prey.

**Project WILD K-12 Guide**

*Thicket Game*  
*Owl Pellets*  
*Quick Frozen Critters*

**Project WILD Aquatic Guide**

*Marsh Munchers*

**3.6 The student will investigate and understand that environments support a diversity of plants and animals that share limited resources. Key concepts include:**

- a. water-related environments (pond, marshland, swamp, stream, river, and ocean environments);
- b. dry-land environments (desert, grassland, rainforest, and forest environments);
- c. population and community.

**Project WILD K-12 Guide**

*Habittracks*  
*Wildlife is Everywhere*  
*How Many Bears Can Live in This Forest*  
*Graphananimal*  
*Habitrekking (indirect)*

**Project WILD Aquatic Guide**

*Water Plant Art*  
*Marsh Munchers*

**3.9 The student will investigate and understand the water cycle and its relationship to life on Earth. Key concepts include**

- a. the energy from the sun drives the water cycle;
- b. processes involved in the water cycle (evaporation, condensation, precipitation);
- c. water is essential for living things; and
- d. water supply and water conservation.

**Project WILD Aquatic Guide**

*How Wet is Our Planet?*  
*Aqua Words (indirect)*

**3.10 The student will investigate and understand that natural events and human influences can affect the survival of species. Key concepts include:**

- a. the interdependency of plants and animals;
- b. human effects on the quality of air, water, and habitat;
- c. the effects of fire, flood, disease, erosion, on organisms; and
- d. conservation and resource renewal,

**Project WILD K-12 Guide**

*Environmental Barometer*  
*Playing Lightly On The Earth*

**Project WILD Aquatic Guide**

*What's In The Water?*

## Fourth Grade

**4.5 The student will investigate and understand how plants and animals in an ecosystem interact with one another and the nonliving environment. Key concepts include:**

- a. behavioral and structural adaptations;
- b. organization of communities;
- c. flow of energy through food webs;
- d. habitats and niches;
- e. life cycles;
- f. influence of human activity on ecosystems.

### **Project WILD K-12 Guide**

*Grasshopper Gravity*  
*Microtrek Treasure Hunt*  
*Quick Frozen Critters*  
*Owl Pellets*  
*Habitat Rummy*  
*Adaptation Artistry*

### **Project WILD Aquatic Guide**

*Designing a Habitat*  
*Edge of Home*  
*Water Plant Art*  
*Fashion a Fish*

**4.6 The students will investigate and understand how weather conditions and phenomena occur and can be predicted. Key concepts include:**

- a. weather measurements and meteorological tools (air pressure-barometer, wind speed-anemometer, rainfall-rain gauge, and temperature-thermometer); and
- b. weather phenomena (fronts, clouds, and storms).

### **Project WILD K-12 Guide**

*Stormy Weather (indirect)*

### **Project WILD Aquatic Guide**

*Where Does Water Run?*  
*Puddle Wonders*

**4.8 The student will investigate and understand important Virginia natural resources. Key concepts include:**

- a. watershed and water resources;
- b. animals and plants;
- c. minerals, rocks, ores, and energy sources;
- d. forests, soil, and land.

### **Project WILD K-12 Guide**

*Who Fits Here*  
*Animal Charades*

### **Project WILD Aquatic Guide**

*Fishy Who's Who*  
*Where Does Water Run*  
*Watershed*  
*Watered-Down History*

## Fifth Grade

**5.5 The student will investigate and understand that organisms are made of cells and have distinguishing characteristics. Key concepts include:**

- a. basic cell structures and functions;
- b. kingdoms of living things;
- c. vascular and nonvascular plants; and
- d. vertebrates and invertebrates.

### **Project WILD K-12 Guide**

*Grasshopper Gravity*  
*Interview a Spider(indirect)*

### **Project WILD Aquatic Guide**

*Micro Odyssey*  
*Fashion A Fish*

**5.6 The student will investigate and understand characteristics of the ocean environment. Key concepts include:**

- a. geological characteristics (continental shelf, slope, rise);
- b. physical characteristics (depth, salinity, major currents); and
- c. biological characteristics (ecosystems).

**Project WILD K-12 Guide**

*Who Fits Here? (indirect)*

**Project WILD Aquatic Guide**

*Marsh Munchers*

*Turtle Hurdles*

*Net Gain, Net Effect*

*A Whale of A Tail*

**Sixth Grade**

**6.7 The student will investigate and understand the natural processes and human interactions that affect watershed systems. Key concepts include**

- a. the health of ecosystems and the abiotic factors of a watershed;
- b. the location and structure of Virginia's regional watershed systems;
- c. divides, tributaries, river systems, and river and stream processes;
- d. wetlands;
- e. estuaries;
- f. major conservation, health, and safety issues associated with watersheds; and
- g. water monitoring and analysis using field equipment including hand-held technology.

**Project WILD Aquatic Guide**

*Where Does Water Run?*

*Watershed*

*Marsh Munchers*

*Wetland Metaphors*

**6.9 The student will investigate and understand public policy decisions relating to the environment. Key concepts include**

- a. management of renewable resources (water, air, soil, plant life, animal life);
- b. management of nonrenewable resources (coal, oil, natural gas, nuclear power, mineral resources);
- c. the mitigation of land-use and environmental hazards through preventive measures; and
- d. cost/benefit tradeoffs in conservation policies.

**Project WILD K-12 Guide**

*Flip the Switch for Wildlife*

*Water's Going On?!*

*Hazardous Links*

*Sustainability: Then, Now, Later*

*Pay to Play*

**Project WILD Aquatic Guide**

*Where Have All the Salmon Gone?*

*Dragonfly Pond*

## Life Science

**LS.4 The student will investigate and understand that the basic needs of organisms must be met in order to carry out life processes. Key concepts include:**

- plant needs (light and energy sources, water, gases, nutrients);
- animal needs (food, water, gases, shelter, space);
- factors that influence life processes.

### **Project WILD K-12 Guide**

*Oh, Deer*  
*Habitrekking*  
*Urban Nature Search*  
*My Kingdom for a Shelter*  
*Habitat Lap Sit*  
*How Many Bear...? (indirect)*

### **Project WILD Aquatic Guide**

*Designing a Habitat*

**LS.5 The student will investigate and understand how organisms can be classified. Key concepts include**

- distinguishing characteristics among kingdoms of organisms;
- distinguishing characteristics of major animal and plant phyla; and
- the characteristics of the species.

### **Project WILD K-12 Guide**

*Adaptation Artistry*  
*Tracks (indirect)*

### **Project WILD Aquatic Guide**

*Micro Odyssey*  
*Fashion a Fish*

**LS.7 The student will investigate and understand that organisms within an ecosystem are dependent on one another and on nonliving components of the environment. Key concepts include:**

- the carbon, water, and nitrogen cycles;
- interactions resulting in a flow of energy and matter throughout the system;
- complex relationships within terrestrial, freshwater, and marine ecosystems; and
- energy flow in food webs and energy pyramids.

### **Project WILD K-12 Guide**

*Eco Enrichers*  
*Which Niche?*  
*Who Fits Here?*  
*Ecosystem Facelift*

### **Project WILD Aquatic Guide**

*Water Canaries*  
*The Edge of Home*  
*Blue-Ribbon Niche*

**LS.8 The student will investigate and understand that interactions exist among members of a population. Key concepts include:**

- competition, cooperation, social hierarchy, territorial imperative;
- influence of behavior on population interactions.

### **Project WILD K-12 Guide**

*Carrying Capacity*  
*Muskox Maneuvers*  
*Ants On A Twig*



**LS.9 The student will investigate and understand interactions among populations in a biological community.**

**Key concepts include:**

- a. the relationship among producers, consumers, and decomposers in food webs;
- b. the relationship of predators and prey;
- c. competition and cooperation;
- d. symbiotic relationships; and
- e. niches;

**Project WILD K-12 Guide**

*Good Buddies*  
*Ecosystem Facelift*

**Project WILD Aquatic Guide**

*Blue Ribbon Niche*

**LS.10 The student will investigate and understand how organisms adapt to biotic and abiotic factors in a biome.**

**Key concepts include:**

- a. differences between ecosystems and biomes;
- b. characteristics of land, marine, and freshwater biomes;
- c. adaptations that enable organisms to survive within a specific biome.

**Project WILD K-12 Guide**

*Who Fits Here*  
*Which Niche?*  
*Ecosystem Facelift*

**LS.11 The student will investigate and understand that ecosystems, communities, populations, and organisms are dynamic and change over time (daily, seasonal, and long term). Key concepts include:**

- a. phototropism, hibernation, and dormancy;
- b. factors that increase or decrease population size; and
- c. eutrophication, climate change, and catastrophic disturbances.

**Project WILD K-12 Guide**

*Pond Succession*  
*Checks and Balances*  
*Carrying Capacity*  
*Rainfall and the Forest*  
*Forest in a Jar*

**Project WILD Aquatic Guide**

*Migration Headache*  
*The Glass Menagerie*

**LS.12 The student will investigate and understand the relationships between ecosystem dynamics and human activity. Key concepts include:**

- a. food production and harvest;
- b. change in habitat size, quality, and structure;
- c. change in species competition;
- d. population disturbances and factors that threaten and enhance species survival;
- e. environmental issues (water supply, air quality, energy production, and waste management).

**Project WILD K-12 Guide**

*Pay to Play*  
*Riparian Zone*  
*Shrinking Habitat*  
*Deer Crossing*  
*Changing the Land*  
*Sustainability: Then and Now*

**Project WILD Aquatic Guide**

*Aquatic Roots*  
*Net Gain, Net Effect*  
*Where Have All the Salmon Gone?*

**LS.13 The student will investigate and understand that organisms reproduce and transmit genetic information to new generations. Key concepts include**

- a. the role of DNA;
- b. the function of genes and chromosomes;
- c. genotypes and phenotypes;
- d. factors affecting the expression of traits;
- e. characteristics that can and cannot be inherited;
- f. genetic engineering and its applications; and
- g. historical contributions and significance of discoveries related to genetics.

**Project WILD K-12 Guide**

*Bottleneck Genes*

**LS.14 The student will investigate and understand that organisms change over time. Key concepts include:**

- a. the relationships of mutation, adaptation, natural selection, and extinction;
- b. evidence of evolution of different species in the fossil record; and
- c. how environmental influences, as well as genetic variation, can lead to diversity of organisms.

**Project WILD K-12 Guide**

*Here Today, Gone Tomorrow*

*Bottleneck Genes*

*Back from the Brink (indirect)*

**Earth Science**

**ES.7 The student will investigate and understand the differences between renewable and nonrenewable resources. Key concepts include:**

- a. fossil fuels, minerals, rocks, water, and vegetation;
- b. advantages and disadvantages of various energy sources;
- c. resources found in Virginia;
- d. making informed judgments related to resource use and its effects on Earth systems; and
- e. environmental costs and benefits.

**Project WILD K-12 Guide**

*Sustainability: Then, Now, Later*

*Flip the Switch for Wildlife*

**Project WILD Aquatic Guide**

*Dragonfly Pond*

*To Dam or Not to Dam*

**ES.9 The student will investigate and understand how freshwater resources are influenced by geologic processes and the activities of humans. Key concepts include**

- a) processes of soil development;
- b) development of karst topography;
- c) identification of groundwater zones including water table, zone of saturation, and zone of aeration;
- d) identification of other sources of fresh water including rivers, springs, and aquifers with reference to the hydrologic cycle;
- e) dependence on freshwater resources and the effects of human usage on water quality; and
- f) identification of the major watershed systems in Virginia including the Chesapeake Bay and its tributaries.

**Project WILD K-12 Guide**

*Stormy Weather (indirect)*

*Rainfall in the Forest (indirect)*

**Project WILD Aquatic Guide**

*Alice in Waterland*

*Where Does Water Run?*

*Watershed*

## Biological Science

**Bio. 6** The student will investigate and understand common mechanisms of inheritance and protein synthesis.

**Key concepts include**

- a. cell division;
- b. sex cell formation;
- c. cell specialization
- d. prediction of inheritance of traits based on the laws of heredity;
- e. effects of genetic recombination and mutation;
- f. events involved in the construction of proteins; and
- g. exploration of the impact of DNA technologies

### **Project WILD K-12 Guide**

*Bottleneck Genes*

**Bio. 8** The student will investigate and understand how populations change over time. Key concepts include

- a. examining evidence found in fossil records;
- b. investigating how variation of traits, reproductive strategies, and environmental pressures impact on the survival of populations
- c. recognizing how adaptations lead to natural selection; and
- d. exploring how new species emerge.

### **Project WILD K-12 Guide**

*Back from the Brink*

*Bottleneck Genes*

### **Project WILD Aquatic Guide**

*Eat and Glow (indirect)*

**Bio. 9** The student will investigate and understand dynamic equilibria within populations, communities, and ecosystems. Key concepts include

- a. interactions within and among populations including carrying capacities,
- b. limiting factors and growth curves;
- c. nutrient cycling with energy flow through ecosystems;
- d. succession patterns in ecosystems;
- e. the effects of natural events and human influences on ecosystems; and
- f. analysis of local ecosystems

### **Project WILD K-12 Guide**

*Turkey Trouble*

*Carrying Capacity*

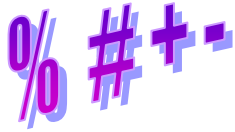
*Checks and Balances*

### **Project WILD Aquatic Guide**

*Migration Headaches*

*Where Have All The Salmon Gone*





## Project WILD and the Standards of Learning for Mathematics

Many of the Project WILD Activities will assist in teaching mathematical skills found in the Virginia Standards of Learning objectives.

### *Graphing*

#### **Project WILD K-12 Guide**

Graphananimal (grades K-4)  
Bearly Growing (grades 5-8)  
Oh Deer (grades 5-8)  
World Travelers (grades 5-8)  
How Many Bears ... (grades 5-8)  
Birds of Prey (grades 9-12)

#### **Project WILD Aquatic Guide**

What's in the Water? (grades 5-8)  
Where Have All the Salmon Gone?  
(grades 5-8)  
Eat and Glow (grades 7-10)

### *Computation and Estimation*

#### **Project WILD K-12 Guide**

Checks and Balances (grades 5-8)  
Lobster in Your Lunch Box (grades 5-8)  
No Water Off a Duck's Back (grades 5-8)  
I'm Thirsty (grades 6-8)  
Dropping in on Deer (grades 9-12)

#### **Project WILD Aquatic Guide**

Puddle Wonders (grades 5-8)  
Alice in Waterland (grades 5-8)  
Water's Going On? (grades 5-8)  
How Wet Is Our Planet? (grades 5-8)

### *Measurement*

#### **Project WILD Aquatic Guide**

Puddle Wonders (grades 5-8)  
Whale of a tail (grades 5-8)  
Watershed (grades 5-8)  
How Wet Is Our Planet? (grades 5-8)  
Where Does Water Run? (grades 5-8)

### *Percentages*

#### **Project WILD K-12 Guide**

Lobster in Your Lunch Box (grades 5-8)  
How Many Bears ... (grades 5-8)

#### **Project WILD Aquatic Guide**

How Wet Is Our Planet? (grades 5-8)

### *Geometry*

#### **Project WILD K-12 Guide**

Spider Web Geometry (grades 5-8)

#### **Project WILD Aquatic Guide**

Puddle Wonders? (grades 5-8)  
Where Does Water Run? (grades 5-8)

### *Data Collection*

#### **Project WILD Aquatic Guide**

Net Gain, Net Effect (grades 5-8)  
Water's Going On? (grades 5-8)  
What's in the Air? (grades 5-8)  
Eat and Glow (grades 7-10)

### *Exponential Growth Curves*

#### **Project WILD K-12 Guide**

Turkey Trouble (grades 9-12)

For more information visit:

[http://www.dgif.virginia.gov/education/wildlife\\_education.html](http://www.dgif.virginia.gov/education/wildlife_education.html)

